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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,234	07/31/2003	Nisha D. Talagala	82225P7136X	2445

45065 7590 01/30/2006

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EXAMINER	
CHASE, SHELLY A	

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 01/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/633,234	TALAGALA ET AL.	
	Examiner	Art Unit	
	Shelly A. Chase	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

SHELLY CHASE
PRIMARY EXAMINER

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7-03 & 9-05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1 to 30 are presented for examination.

Information Disclosure Statement

2. The references listed in the information disclosure statement submitted on 7-31-2003 and 9-20-2005 have been considered by the examiner (see attached PTO-1449).

Specification

3. The abstract of the disclosure is objected to because acronyms must be defined at their first usage in the specification, this objection applies to the acronym "IMD".

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims **1** to **30** are rejected under 35 U.S.C. 103(a) as being unpatentable over DeKoning et al. (USP 6553511 B1).

Claims **1** and **11**:

DeKoning substantially teaches the claimed invention. DeKoning teaches a mass storage data integrity assuring technique, comprising: a redundant array of independent disks (RAID) mass storage system with a plurality of disk (14) wherein each disks includes rotating disks (50) where data is written on the magnetic surfaces on tracks (see col. 8, lines 49 to 65). DeKoning also teaches that each track is formatted to define a plurality of fixed length sectors with a 512 byte data block (see col. 9, lines 3 to 10) and each component recorded on the disk is represented as a user data structure (U) and a parity data structure (P) ("user data segment and an associated IMD segment") (see col. 10, lines 15 to 25).

DeKoning also teaches that the parity data structure includes a sequence number filed (92), a checksum filed (86) and a revision number field (94) ("version identifier IMD and at least one other type of IMD) (see col. 13, lines 40 et seq.). DeKoning does not specifically teach validating the data block by verifying version identifier IMD and as least one of the at least one other type of IMD; however, DeKoning teaches using the sequence numbers and the revision number to detect and correct errors (see col. 19, lines 35 to 50) and determining whether the CRC and checksum are valid (see col. 20, lines 15 et seq.).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the process of detecting errors and verifying the checksum of DeKoning with verifying the version identifier IMD and at least one other type of IMD as claimed in view of their closely related functions. I.E., DeKoning teaches that the use of sequence numbers and revision numbers for verifying

are effective in detecting silent data path errors as well as drive data corruption errors in reading and writing data to or from a storage medium or cache (see col. 23, lines 50 to 62). This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ an effective method for detecting data path errors as taught by DeKoning.

As per claims **2** to **4** and **12** to **14**, DeKoning teaches that the data structure P includes a checksum filed ((86) and a logical block address (LBA) filed (88) (see col. 14, lines 29 to 34).

As per claims **5** and **15**, DeKoning teaches that the metadata returned form the disk drive matches the metadata from the read request (see col. 20 lines 40 to 50); interpreted as "wherein verifying the version identifier IMD includes determining that a first version identifier stored within the data block matches a second version identifier stored outside of the data block."

As per claims **6** and **16**, DeKoning teaches determining the validity of the checksum by first calculating a cyclic redundancy check (CRC) code and checksum by a processor (67) (see col. 20, lines 16 et seq.). DeKoning also teaches that the computed CRC and checksum are then checked against the read CRC and checksum to verify errors (see col. 20, lines 25 et seq.).

As per claims **7** and **17**, DeKoning teaches that a determination is made to see whether the LBA returned from the storage medium matches the LBA in the read request (see col. 19, lines 51 et seq.).

As per claims **8** to **10** and **18** to **20**, DeKoning teaches that the step of comparing the sequence numbers and the revision numbers can detect errors such as data path corruption as well as checking to see if the U data structure and the P data structure have the same revision number and if data was written incorrectly to the specified address (see col. 21, lines 1 to 44). DeKoning also teaches verifying the checksum (see col. 20, lines 25 to 35).

Claim **21**:

DeKoning substantially teaches the claimed invention. DeKoning teaches a mass storage data integrity assuring technique, comprising: a plurality of redundant groups (20) that includes a plurality of disks (14) ("mass storage") (see fig. 1 and col. 6, lines 20 to 25), an array processor (30) (see col.6, lines 46 to 48) and a RAID parity assist memory (RPA) (32) connected to the array processor (see col. 6, lines 37 to 42).

DeKoning also teaches that data is written in blocks in the RPA memory and that similar data is written to the disk (14) (see col. 8, lines 30 to 35). DeKoning further teaches that each of the plurality of disks (14) includes rotating disk (50) where data is written on the magnetic surfaces on tracks (see col. 8, lines 49 to 65).

DeKoning teaches that each track is formatted to define a plurality of fixed length sectors with a 512 byte data block (see col. 9, lines 3 to 10) and each component recorded on the disk is represented as a user data structure (U) and a parity data structure (P) ("user data segment and an associated IMD segment") (see col. 10, lines 15 to 25). DeKoning teaches that each of the (U & P) data structure includes metadata

wherein the metadata includes a sequence number filed (92), a checksum filed (86) and a revision number field (94) ("version identifier IMD and at least one other type of IMD) (see col. 13, lines 40 et seq.).

DeKoning does not specifically teach validating the data block by verifying version identifier IMD and as least one of the at least one other type of IMD; however, deKoning teaches using the sequence numbers and the revision number to detect and correct errors (see col. 19, lines 35 to 50) and determining whether the CRC and checksum are valid (see col. 20, lines 15 et seq.).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the process of detecting errors and verifying the checksum of DeKoning with verifying the version identifier IMD and at least one other type of IMD as claimed in view of their closely related functions. I.E., DeKoning teaches that the use of sequence numbers and revision numbers for verifying are effective in detecting silent data path errors as well as drive data corruption errors in reading and writing data to or from a storage medium or cache (see col. 23, lines 50 to 62). This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ an effective method for detecting data path errors as taught by DeKoning.

As per claims **22** to **24**, DeKoning teaches that the data structure P includes a checksum filed ((86) and a logical block address (LBA) filed (88) (see col. 14, lines 29 to 34).

As per claim **25**, DeKoning teaches that the metadata returned form the disk drive matches the metadata from the read request (see col. 20 lines 40 to 50); interpreted as "wherein verifying the version identifier IMD includes determining that a first version identifier stored within the data block matches a second version identifier stored outside of the data block."

As per claim **26**, DeKoning teaches determining the validity of the checksum by first calculating a cyclic redundancy check (CRC) code and checksum by a processor (67) (see col. 20, lines 16 et seq.). DeKoning also teaches that the computed CRC and checksum are then checked against the read CRC and checksum to verify errors (see col. 20, lines 25 et seq.).

As per claim **27**, DeKoning teaches that a determination is made to see whether the LBA returned from the storage medium matches the LBA in the read request (see col. 19, lines 51 et seq.).

As per claims **28** to **30**, DeKoning teaches that the step of comparing the sequence numbers and the revision numbers can detect errors such as data path corruption as well as checking to see if the U data structure and the P data structure have the same revision number and if data was written incorrectly to the specified address (see col. 21, lines 1 to 44). DeKoning also teaches verifying the checksum (see col. 20, lines 25 to 35).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelly A. Chase whose telephone number is 571-272-3816. The examiner can normally be reached on Mon-Thur from 8:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on 571-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SHELLY CHASE
PRIMARY EXAMINER